CLAIMS

1. Lighting element (1, 11, 21, 31) with a luminescent surface containing a layer system with a base electrode layer (7, 17, 27, 37) made from an electrically conductive material and directly or indirectly arranged thereon a translucent dielectric layer (5, 15, 25, 35) with a front surface and a back surface facing the base electrode, where the dielectric layer (5, 15, 25, 35) contains an arrangement of pores (8 18, 28, 38) extending between the front and back surfaces and the pores (8 18, 28, 38) are open to the front surface, and emitter rods (4, 14, 24, 34) of an electrically conductive material are arranged within pores, where the emitter rods are connected to the base electrode in an electrically conductive manner, and opposite the emitter rods is a translucent counter-electrode of an electrically conductive material, and between the emitter rods and the counter-electrode is arranged a luminescent material,

   characterised in that

   the counter-electrode (2, 12, 22, 32) is part of the layer system and is a layer covering the pore cavities (8 18, 28, 38) and arranged directly or indirectly on the front surface of the dielectric layer, and luminescent material (3, 13, 23, 33) is arranged between the emitter rods (4, 14, 24, 34) and the layer of counter-electrode (2, 12, 22, 32), and the dielectric layer (5) is a spacer which separates the base electrode (7, 17, 27, 37) and the counter-electrode.

2. Lighting element according to claim 1, wherein the emitter rods (4, 14, 24, 34) extend over a distance of less than the pore length and preferably extend no closer than two pore diameters to the front surface of the pores.

3. Lighting element according to any of claims 1 to 2, wherein the luminescent material is arranged as a layer (23) covering the pore cavities (28), directly or indirectly on the front surface of the dielectric layer (25), and the counter-electrode (22) is arranged directly or indirectly on the exposed surface of the luminescent layer (23).

4. Lighting element according to any of claims 1 to 3, wherein the luminescent material (3, 13) is arranged in the pore cavity (8, 18) between the emitter rods (4, 14) and the pore openings.

5. Lighting element according to any of claims 1 to 4, wherein the luminescent material is arranged partly or fully as a layer (3) on the exposed surface of the pore inner walls to form a central pore cavity.

6. Lighting element according to any of claims 1 to 5, wherein a layer of intermediate electrode (40) of a conductive material, preferably metal, surrounding the pore openings is arranged directly or indirectly on the dielectric layer (35), and the counter-electrode (32) is arranged over the intermediate electrode (40), where between the counter-electrode (32) and the intermediate electrode (40) is arranged at least one luminescent layer (33) covering the pore openings and/or a further dielectric layer.

7. Lighting element according to any of claims 1 to 6, wherein the dielectric layer (5, 15, 25, 35) is an anodised layer of a metal oxide, in particular an aluminium oxide.

8. Lighting element according to any of claims 1 to 7, wherein the base electrode (7, 17, 27, 37) is made from aluminium or an aluminium alloy and the dielectric layer (5, 15, 25, 35) is an aluminium oxide alloy, preferably an aluminium oxide alloy produced by means of anodisation directly from the base electrode.

9. Lighting element according to any of claims 1 to 8, wherein the counter-electrode (2, 12, 22, 32) contains or consists of a layer of a transparent and conducting electrode, preferably of indium tin oxide (ITO).

10. Lighting element according to any of claims 1 to 9, wherein the lighting element is a cold cathode field emission device and the base electrode (7, 17, 27, 37) is a base cathode, the emitter rods (4, 14, 24, 34) are emitter cathodes and the counter-electrode (2, 12, 22, 32) is the anode and the luminescent material (3, 13, 23, 33) is stimulated by the electron beams emitted from the emitter rods and the pore cavity (8, 18, 28, 38) is partly or fully evacuated.

11. Lighting element according to any of claims 1 to 9, wherein the pore cavity (8, 18, 28, 38) contains a plasma-forming gas, preferably an inert gas, in particular argon, neon, and/or helium, and the luminescent material (3, 13, 23, 33) is stimulated under gas discharge processes under alternating current conditions.

12. Lighting element according to any of claims 1 to 9, wherein lighting element operates on basis of electro-luminescence whereby the luminescent substance (3, 13, 23, 33) is stimulated by the application of an electric field.

13. Lighting element according to any of claims 1 to 12, wherein one or more translucent protective layers are arranged on the counter-electrode (2, 12, 22, 32) where the protective layers serve to seal the pores in order to prevent the exchange of gases or to maintain a permanent vacuum.

14. Lighting element according to any of claims 1 to 13, wherein the lighting element has a matrix addressing of the base electrode and/or counter-electrode for the purpose of directing the light emission of individual surface points or surface sections, this to build a display.

15. A method of making a luminous element according to claim 1 by the steps of

a) providing a base electrode (7, 17, 27, 37) made of aluminium,

b) providing a porous dielectric anodic aluminium oxide layer (5, 15, 25, 35) by anodising the base electrode,

c) providing wire-like emitter rods (4, 14, 24, 34) in the pores of the dielectric layer having back ends and front ends, where the front ends of the emitter rods lie below the front surface of the dielectric layer,

characterised by the steps of

i) providing the pores (8, 18, 28, 38) and/or the front surface of the dielectric layer with a layer of luminescent material before or after the deposit of the emitter rods,

ii) providing the front surface of the dielectric layer directly or indirectly with a layer of a counter-electrode (2, 12, 22, 32).

16. Method according to claim 15, wherein the exposed surface of the pore walls is partly or fully coated with a luminescent material (3).

17. Method according to any of claims 15 to 16, wherein the counter-electrode contains or consists of a layer of indium tin oxide (ITO) and the counter-electrode (2, 12, 22, 32) is applied to the dielectric layer in a vacuum coating procedure.

16. Use of a lighting element (1, 11, 21, 31) according to claim 1 as a flat lighting element on walls and facades of buildings, as a background light source for liquid crystal displays (LCD) or as self-illuminating displays or signs.